EAST TEXAS A&M

MATH 538.01B - FUNCTIONS OF COMPLEX VARIABLES I

COURSE SYLLABUS: FALL 2026

AUGUST 20-DECEMBER 11, 2026

Cross-listed with MATH 538.01W

Revised August 26, 2026, to reflect the approved blended-course format.

Instructor: Dr. Mehmet Celik

Course and CRN: MATH 538.01B (CRN: 84888)

Office Hours: On-Campus

Monday & Wednesday: 9:30 AM-11:00 AM
Tuesday & Thursday: 9:00 AM-10:00 AM
or by appointment.

University Email Address: Mehmet.Celik@etamu.edu

Preferred Form of Communication: Email

Communication Response Time: Student course-related questions or concerns sent by email are usually answered within 24 hours during weekdays, Monday through Friday.

Required face-to-face meeting: Tuesday, 3:30–4:45 p.m.

Location: Education South, Sowers, Room 135

Asynchronous component: The remaining weekly instruction is completed through structured D2L modules. There is no regular Thursday face-to-face meeting.

Office Location: Frank Young Education North, Room 111

Prerequisites: MATH 436 with a minimum grade of C, or MATH 438 with a minimum grade of C.

Final Exam: Tuesday, December 8, 2026, 2 PM - 4 PM Central Time

COURSE INFORMATION

MATERIALS

Textbook(s) Required: The main text is A First Course in Complex Analysis by Matthias Beck, Gerald Marchesi, Dennis Pixton, and Lucas Sabalka; the current version is available free online at https://matthbeck.github.io/complex.html and as a PDF at https://matthbeck.github.io/papers/complex.pdf. A useful source for solved problems is Schaum's Outline of Complex Variables, second edition, by Murray R. Spiegel, Seymour Lipschutz, John J. Schiller, and Dennis Spellman, McGraw-Hill, 2009, ISBN 9780071615693. Another useful reference is Complex Variables with Applications by Saminathan Ponnusamy and Herb Silverman, Birkhäuser, 2006, ISBN-13: 978-0817644574. We may occasionally cover enrichment activities not in the text.

MathType or other tools for typing mathematical symbols and equations may be useful for typed homework or project submissions. Students may also submit neatly scanned handwritten work when permitted.

COURSE DESCRIPTION

This course covers the elements of one-dimensional complex analysis: the complex numbers and their algebra, geometry, and topology; analytic functions of a complex variable; integration in the

complex plane, particularly Cauchy's integral formula and its consequences; infinite series of complex numbers and of complex variables, including Taylor series and Laurent series; the residue theorem and the computation of real integrals by complex methods; and conformal mapping.

The following topics are expected to be covered in this course:

The algebraic and geometric properties of complex numbers
Elementary topology of the complex plane
Limits and continuity of complex functions
Complex differentiability and holomorphicity
The Cauchy-Riemann equations
Examples of complex functions
Mobius transformations and cross-ratio
Stereographic projection
Complex exponential, trigonometric, logarithm, and power functions
Definition and basic properties of complex integration
Cauchy's theorem, antiderivatives, and Cauchy's integral formula
Cauchy's estimates and Liouville's theorem
Complex sequences, complex series, Taylor series, and Laurent series
Residue theorem and applications to real integrals; selected conformal-mapping topics as time permits.

Blended Course Format

MATH 538.01B is a blended course. The section has one required weekly face-to-face meeting on Tuesday from 3:30–4:45 p.m. in Education South, Sowers, Room 135. The remaining weekly instruction is completed asynchronously through structured D2L modules. There is no regular Thursday face-to-face meeting.

The asynchronous portion may include recorded instruction or detailed notes, guided practice, examples, discussions, and a required activity or submission. Students are responsible for completing all posted work by the stated deadlines. The blended format does not reduce the course content, learning outcomes, academic expectations, or assessment standards.

STUDENT LEARNING OUTCOMES

By the end of the course, students should be able to:

1. Analyze functions of a complex variable using contour integrals, geometric methods, the Cauchy–Riemann equations, and convergence of complex sequences and series.
2. Explain and apply the major theorems that distinguish complex analysis from real analysis.
3. Apply complex analysis to evaluate contour integrals and analyze geometric mappings.

COURSE REQUIREMENTS

Instructional Methods: This blended section is cross-listed with MATH 538.01W. Students in both sections will follow the same course schedule, learning outcomes, homework expectations, and grading scheme. The course will use a flipped classroom approach with pre-class preparation, guided discussion, and problem-solving activities during class meetings. Students

should review assigned videos, notes, or readings before class and come prepared to discuss questions and work through examples.

Weekly Course Structure

Each weekly module will normally open at the beginning of the week. Students should complete the assigned preparation before the Tuesday face-to-face meeting. Tuesday meetings will focus on explanations, proof discussions, questions, and guided problem solving. The remaining weekly work will be completed asynchronously through D2L and may include a guided-practice activity, written submission, discussion, or other required work.

Course Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course: homework assignments, two midterm exams, and a comprehensive final exam.

Exams

There will be two proctored midterm exams and one proctored comprehensive final exam. Students in the blended section will take exams in class or in another instructor-approved proctored location. Students in the cross-listed web-based section will follow the proctored testing procedures stated in the MATH 538.01W syllabus.

Exam 1: Thursday, October 1, 2026, 3:30 PM-4:45 PM Central Time (at the Academic Testing Center)

Exam 2: Thursday, November 5, 2026, 3:30 PM-4:45 PM Central Time (at the Academic Testing Center)

Comprehensive Final Exam: Tuesday, December 8, 2026, 2 PM - 4 PM Central Time (will be administered through the Academic Testing Center - ATC)

Each midterm exam is worth 100 points. The comprehensive final exam is worth 100 points. Exams may include proof-based, computational, conceptual, and written-response problems. Make-up exams are available only in the case of a documented emergency, an approved university-authorized absence, or an approved accommodation. Students should notify the instructor as soon as reasonably possible and provide documentation when required.

Attendance and Engagement

Because MATH 538.01B is blended, attendance and engagement include both parts of the course:

- Attendance and participation at the required Tuesday face-to-face meeting
- Completion of the required asynchronous D2L work by the posted deadlines

Missing the online portion of a weekly module is comparable to missing part of a regular class meeting. Optional office hours do not replace required participation.

Homework

There will be weekly homework assignments. Each assignment will be graded. Missing questions and answers without supporting work do not earn credit. The questions for a homework assignment will be posted in the weekly module under D2L. The due date for each homework assignment will be announced with the assignment. Late homework submissions generally will not be accepted.

Homework and other required online submissions are part of the asynchronous component of the blended course.

Students may discuss homework ideas with classmates when collaboration is permitted, but the homework assignment you submit must be your own work. Plagiarism is strictly prohibited. Submit homework to the D2L assignment folder using the file name format LastName_FirstName_HW#_Math538.pdf unless the instructor announces a different format.

There will be 10 homework assignments, each worth 10 points, for a total of 100 homework points.

Homework Grading Method: All assigned problems are required. Each homework assignment is worth 10 points. Two focus problems, or substantial parts of problems, will be graded in detail for 4 points each. The remaining required problems will be reviewed collectively for completeness and meaningful supporting work for 2 points. The same focus items will be used for all students in both sections and will not be announced before the deadline. Complete solutions and common feedback will be posted after grading. A final answer without supporting work does not count as a completed solution.

Advanced Project Option

With prior written approval from the instructor, a student who has substantial previous coursework or research experience in complex analysis may complete an advanced reading or semester project in place of selected homework assignments. Requests should normally be made by the end of the second week of the semester, and approval is not automatic. The project must represent new work and may not duplicate a paper, thesis, or project previously submitted for academic credit.

A student participating in this option remains responsible for all course learning outcomes, regular class attendance and participation, selected foundational homework identified by the instructor, and all midterm and final examinations. A written project agreement will specify the project topic, required milestones, final deliverables, deadlines, homework assignments replaced, and the method used to evaluate the project within the homework portion of the course grade. Unless the instructor approves the option in writing, the standard homework requirements apply.

The key to success

We will use a flipped classroom approach. Students should review posted lecture videos, notes, or readings before class meetings and then use class time to engage in active learning. During class, ask questions, fully participate in activities, collaborate with peers when permitted, and seek support when needed.

Workload and Assistance

Students should expect to spend about 12 to 14 hours each week on course material. This includes studying posted material, working on homework assignments, preparing for exams, and reviewing feedback. Some weeks, especially exam weeks, may require more time; other weeks may require less. Please ask questions and seek assistance as needed. Emails are usually answered within 24 hours during weekdays, Monday through Friday.

GRADING

This class will be graded on a total points system. A maximum of 400 points is possible. All students in the cross-listed MATH 538.01B and MATH 538.01W sections will use the same grading matrix. The grade is completely objective and is determined solely by student performance on homework assignments, two midterm exams, and the final exam. Do not expect extra credit assignments.

Grading Matrix

Instrument	Value (points)	Total
HW Assignments	10 homework assignments at 10 points each	100 pts
Midterm Exams	2 midterm exams at 100 points each	200 pts
Final Exam	One comprehensive final exam at 100 points	100 pts
Total		400 pts

Grade Determination:

A = 360-400 pts; i.e. 90% or better
B = 320-359 pts; i.e. 80-89%
C = 280-319 pts; i.e. 70-79%
D = 240-279 pts; i.e. 60-69%
F = 0-239 pts; i.e. less than 60%

For a student approved for the Advanced Project Option, the project does not create a separate grade category or provide additional bonus points. The project score replaces only the homework scores identified in the written project agreement and is included within the existing homework category. The examination requirements, total course points, and letter-grade scale remain unchanged.

TECHNOLOGY REQUIREMENTS

Students are expected to check their MyLeo email and D2L Brightspace announcements regularly. Students will need access to MyLeo, D2L Brightspace, and any required course software for course materials, announcements, assignments, and grades.

Students must be able to scan handwritten work into a single PDF file when required. A scanner or a cell phone with a scanning app, such as Adobe Scan or a similar app, is acceptable. Phones may be used for scanning permitted homework or assignment submissions, but they may not be used during exams unless explicitly approved by the instructor.

Access to a printer is helpful for printing handouts, reviews, or practice exams. Access to Microsoft Word or compatible software may be helpful for typed assignments, reports, or project submissions.

A TI-83/TI-84 or equivalent graphing calculator is recommended when appropriate. Calculators or software with symbolic algebra, CAS, or automatic problem-solving capabilities are not allowed on quizzes or proctored exams unless explicitly approved by the instructor. Calculator memory may be cleared before and after proctored exams.

For D2L/Brightspace technical issues, students should contact Brightspace Technical Support. For third-party software issues, students should contact the appropriate vendor support. Students should document technical problems and email the instructor before the relevant deadline whenever possible. Technical issues reported after a deadline may not be accepted as a reason for late work.

ACCESS AND NAVIGATION

Students will need their campus-wide ID and password to log into MyLeo, D2L Brightspace, and other university systems. Students who do not know their campus-wide ID or have forgotten their password should contact the Center for IT Excellence.

Personal computer and internet connection problems do not excuse the requirement to complete all coursework in a timely and satisfactory manner. Each student should have a backup method for dealing with technology or internet problems. These methods might include a backup computer, a public library computer, an East Texas A&M campus computer lab, or another reliable backup location.

COMMUNICATION AND SUPPORT

BRIGHTSPACE SUPPORT

Students who have questions or difficulties with the course material should contact the instructor.

For Brightspace technical support, students should use Brightspace Technical Support through D2L or call the Brightspace support number provided by the university.

SYSTEM MAINTENANCE

D2L runs monthly updates during the last week of the month, usually on Wednesday. The system should remain up during this time unless otherwise specified in an announcement. Students may experience minimal impacts to performance and/or the look and feel of the environment.

INTERACTION WITH INSTRUCTOR STATEMENT

Student course-related questions or concerns sent by email are usually answered within 24 hours during weekdays, Monday through Friday. Feedback on assessments will generally be provided within 7 days after submission, except near the end of the term when final grade submission deadlines may require a different timeline.

My primary communication with the class will be through official university email and D2L announcements. Students are responsible for checking both regularly.

STUDENT ACADEMIC RESOURCES

Math Skills Center (MSC): Free math tutoring may be available through the Math Skills Center/Math Lab and other university academic support services. Updated hours, locations, and access instructions will be posted in D2L or announced by the university.

The East Texas A&M Academic Success Center provides academic resources to help students succeed. Updated links and access instructions will be posted in D2L.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures

Reporting D2L and Course-Software Technical Problems

Students should contact Brightspace Technical Support for D2L issues and the appropriate vendor support for third-party software issues. Students should document technical problems and email the instructor before the relevant deadline whenever possible. Technical issues reported

after a deadline may not be accepted as a reason for late work. Personal computer or internet access problems are not a guaranteed excuse for missed coursework.

SYLLABUS CHANGE POLICY

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance through university email and/or D2L announcements.

University Specific Procedures

Academic Integrity

Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including (but not limited to) receiving a failing grade on the assignment, the possibility of failure in the course, and dismissal from the University. Since dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. In ALL instances, incidents of academic dishonesty will be reported to the Department Head. Please be aware that academic dishonesty includes (but is not limited to) cheating, plagiarism, and collusion.

In this course, unauthorized use of AI tools, online solvers, answer-sharing websites, symbolic algebra systems, or another person's work to complete quizzes, exams, homework, or submitted assignments is considered academic misconduct unless explicitly permitted by the instructor.

Cheating is defined as:

Copying another's test or assignment
Communication with another during an exam or assignment (written, oral, or otherwise)
Giving or seeking aid from another when not permitted by the instructor
Possessing or using unauthorized materials during the test
Buying, using, stealing, transporting, or soliciting a test, draft of a test, or answer key
Plagiarism is defined as:

Using someone else's work in your assignment without appropriate acknowledgment
Making slight variations in the language and then failing to give credit to the source
Collusion is defined as:

Collaborating with another, without authorization, when preparing an assignment
If you have any questions regarding academic dishonesty, ask. Otherwise, I will assume that you have full knowledge of the academic dishonesty policy and agree to the conditions as set forth in this syllabus.

AI use policy

East Texas A&M University acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided, the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used AI in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty

13.99.99.R0.10 Graduate Student Academic Dishonesty

East Texas A&M University Supports Students' Mental Health

The Counseling Center at East Texas A&M University, located in the Halladay Student Services, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, students should consult the Counseling Center website or D2L resources.

ADA STATEMENT

The Americans with Disabilities Act is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities.

Students who need disability-related accommodations should contact Student Disability Services, Velma K. Waters Library, Suite 162, at 903-886-5150 or StudentDisabilityServices@etamu.edu. The fax number is 903-468-8148. Students are encouraged to request accommodation letters near the beginning of the semester because accommodations are not retroactive.

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Handbook and the Student Code of Conduct.

Student Handbook: https://www.etamu.edu/student-handbook/

Student Code of Conduct: https://www.etamu.edu/student-code-of-conduct/

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:

Rules of Netiquette: https://www.albion.com/netiquette/corerules.html

ETAMU Attendance

It is expected that students follow the guidelines set forth by the Class Attendance Policy in the current Undergraduate or Graduate Catalog, as applicable. Regular attendance and active participation are expected. Students who must miss class because of a university activity or documented emergency should notify the instructor in writing as early as possible.

If students represent an athletic team for this university, a departmental team, scholastic team, choir, or other group and must miss class or coursework, they should notify the instructor in writing with appropriate documentation as early as possible.

Copyright Policy

The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this course, which include but are not limited to syllabi, lecture notes, quizzes, exams, in-class

materials, review sheets, projects, and problem sets. Because these materials are copyrighted, you do not have the right to copy and distribute the handouts.

NONDISCRIMINATION NOTICE

East Texas A&M University will comply in the classroom and in online courses with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information, or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and East Texas A&M Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url: https://inside.tamuc.edu/aboutus/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all East Texas A&M campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

Unless otherwise announced, the Tuesday portion of each week is completed face-to-face, and the remaining weekly instruction is completed asynchronously through D2L

COURSE OUTLINE / CALENDAR

Week	Dates	Topics / Assessments
Week 1	Aug. 20-21	Orientation; complex numbers; algebraic and geometric properties
Week 2	Aug. 24-28	Elementary topology of the complex plane; limits and continuity
Week 3	Aug. 31-Sept. 4	Differentiability and holomorphicity; Cauchy-Riemann equations
Week 4	Sept. 7-11	Labor Day, Sept. 7: university closed; examples of complex functions; Mobius transformations
Week 5	Sept. 14-18	Mobius transformations; cross-ratio; stereographic projection
Week 6	Sept. 21-25	Complex exponential, trigonometric, logarithm, and power functions; review

Week	Dates	Topics / Assessments
Week 7	Sept. 28-Oct. 2	Exam 1 review; Exam 1 on Thursday, Oct. 1
Week 8	Oct. 5-9	Definition and basic properties of complex integration; Fall Break, Oct. 8–9
Week 9	Oct. 12-16	Complex integration; antiderivatives; Cauchy's theorem
Week 10	Oct. 19-23	Cauchy integral formula
Week 11	Oct. 26-30	Cauchy's integral formulas for derivatives; Morera's theorem; simply connected regions; Cauchy's estimates; Liouville's theorem; Fundamental Theorem of Algebra
Week 12	Nov. 2-6	Exam 2 review; Exam 2 on Thursday, Nov. 5
Week 13	Nov. 9-13	Complex sequences
Week 14	Nov. 16-20	Complex series: definitions, convergence, and absolute convergence
Week 15	Nov. 23-27	Complex series continued; Thanksgiving Break begins Nov. 25; university closed Nov. 26–27
Week 16	Nov. 30-Dec. 4	Course review and final-exam preparation; Taylor series as time permits
Finals	Dec. 7-11	Comprehensive Final Exam: Tuesday, December 8, 2026, 2:00–4:00 p.m. Central Time; administered through the Academic Testing Center (ATC).

This schedule is subject to change by the instructor. Any changes to this schedule will be communicated through university email and D2L announcements.